IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellants: Culbertson et al.   Patent Application

Application Number: 10/684,033   Group Art Unit: 2154

Filed: October 9, 2003   Examiner: Jean, F.

For: Method and System for Clustering Data Streams for a Virtual Environment

APPEAL BRIEF

Table of Contents

I. Real Party in Interest

The assignee of the present invention is Hewlett-Packard Development Company,

L.P.

II. Related Appeals and Interferences

There are no related appeals or interferences known to the Appellants.

Claims 1- 40 are rejected. This Appeal involves Claims 1-40.

IV. Status of Amendments

All proposed amendments have been entered. An amendment subsequent to the Final Action has not been filed.

<u>V. Summary of Claimed Subject Matter</u>

Independent Claims 1, 16, 23, 25, and 40 of the present application pertain to embodiments associated with methods and systems for clustering data in a virtual environment.

As recited in Claim 1, a "method for clustering data in a virtual environment" is disclosed. One embodiment is depicted at least in Figures 2 and 6A. As described in the instant disclosure at least on page 11, line 25, to page 12, line 7, and Figure 2 and 6A, one method includes 210 determining a cluster of receiving nodes 640 in the virtual environment, wherein each of the cluster of receiving nodes 640 have associated values for at least on clustering parameter that as a set satisfies a test. The instant disclosure further includes on at least page 13, lines 12-25, and 220 of Figure 2, generating a common data stream based on at least one clustering parameter. Furthermore, the instant disclosure includes on at least page 13, line 27 to page 14, line 2, and Figures 2 and 6A, sending 230 the common data stream from a sending node 610 to the cluster of receiving nodes 640.

As recited in Claim 16, a "system for clustering data in a virtual environment" is disclosed. One embodiment is depicted at least in Figures 5 and 6A. As described in the instant disclosure at least on page 126, lines 1-3, and Figures 6 and 6A, one embodiment includes clustering module 510 for determining a cluster of receiving nodes 640 in the virtual environment, wherein each of the cluster of receiving nodes 640 have associated values for at least one clustering parameter that as a set satisfies a test. The instant disclosure further includes at least on page 16, lines 3-4, and Figure 5, a data generator 520 for generating a common data stream based on at least one clustering parameter. Furthermore, the instant disclosure includes at least on page 26, lines 5-6, and Figures 5 and 6A, a transmitter 530 for

sending the common data stream from sending node 610 to the cluster of receiving nodes 640.

As recited in Claim 23, a "method for clustering data" is disclosed. One embodiment is depicted at least in Figures 6B and 7. As described in the instant disclosure at least on page 14, lines 19-30, and page 15, lines 1-8, and Figures 6B and 7, one method includes determining 710 a cluster of receiving nodes 680 among a plurality of receiving nodes. At page 15, lines 2-3, a plurality of varying data streams are generated by a sending node 650 for all of the plurality of receiving nodes depending on an associated value of a parameter for all of the plurality of receiving nodes. At page 15, lines 6-8, each of the cluster of receiving nodes 680 have associated values for the parameter that as a set satisfies a test such that data streams associated with the cluster of receiving nodes 680 are substantially similar. The instant disclosure further includes on at least page 16, lines 6-10, and Figures 6B and 7, generating 720 a common data stream of a sending object associated with the sending node 650 based on a representative value of the parameter. Furthermore, the instant disclosure includes on at least pages 16, lines 29-31, and 17, lines 1-5, sending 730 the common data stream to the cluster of receiving nodes 680.

As recited in Claim 25, a "computer readable medium containing executable instructions which, when executed in a processing system, causes the system to perform the steps for clustering data in a virtual environment" method is disclosed. One embodiment is depicted at least in Figures 2 and 6A. As described in the instant disclosure at least on page 11, line 25, to page 12, line 7, and Figure 2 and 6A, one method includes 210 determining a cluster of receiving nodes 640 in the virtual environment, wherein each of the cluster of receiving nodes 640 have associated values for at least on clustering parameter that as a set

satisfies a test. The instant disclosure further includes on at least page 13, lines 12-25, and 220 of Figure 2, generating a common data stream based on at least one clustering parameter. Furthermore, the instant disclosure includes on at least page 13, line 27 to page 14, line 2, and Figures 2 and 6A, sending 230 the common data stream from a sending node 610 to the cluster of receiving nodes 640.

As recited in Claim 40, a "computer system comprising: a processor; and a computer readable memory coupled to said processor and containing program instructions that, when executed, implements a method for clustering data" is disclosed. As described in the instant disclosure at least on page 14, lines 19-30, and page 15, lines 1-8, and Figures 6B and 7, one method includes determining 710 a cluster of receiving nodes 680 among a plurality of receiving nodes. At page 15, lines 2-3, a plurality of varying data streams are generated by a sending node 650 for all of the plurality of receiving nodes depending on an associated value of a parameter for all of the plurality of receiving nodes. At page 15, lines 6-8, each of the cluster of receiving nodes 680 have associated values for the parameter that as a set satisfies a test such that data streams associated with the cluster of receiving nodes 680 are substantially similar. The instant disclosure further includes on at least page 16, lines 6-10, and Figures 6B and 7, generating 720 a common data stream of a sending object associated with the sending node 650 based on a representative value of the parameter. Furthermore, the instant disclosure includes on at least pages 16, lines 29-31, and 17, lines 1-5, sending 730 the common data stream to the cluster of receiving nodes 680.

VI. Grounds of Rejection to Be Reviewed on Appeal

1.   Claims 1-9, 15-33, and 39-40 are rejected under 35 U.S.C. §102(e) as being

anticipated by Boulanger et al. (6,538,808), hereinafter referred to as "Boulanger".

2.   Claims 10-14, and 34-38 are rejected under 35 U.S.C. §103(a) as being unpatentable

over Boulanger in view of Elba et al. (6,757,005), hereinafter referred to as "Elba".

<u>VII. Argument</u>

1. <u>Whether Claims 1-9, 15-33, and 39-40 should be rejected under 35 U.S.C. §102(e) as being anticipated by Boulanger.</u>

Appellants respectfully submit that embodiments of the present invention as recited in Claims 1-9, 15-33, and 39-40 are not anticipated by Boulanger, in view of the following rationale.

Appellants respectfully point out that independent Claim 1 (independent Claims 16, 23, 25, and 40 include similar features) recites "a method for clustering data in a virtual environment, comprising:

determining a cluster of receiving nodes in said virtual environment, wherein each of said cluster of receiving nodes have associated values for at least one clustering parameter that as a set satisfies a test;

<u>generating a common data stream</u> based on said at least one clustering parameter; and

<u>sending said common data stream</u> from a sending node <u>to said cluster of receiving nodes</u>" (emphasis added).

Appellants respectfully note that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference". MPEP §2131; *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 103 (Fed. Cir. 1987).

The Office Action mailed on December 17, 2007 states that "[a]s per claims 1, 16, and 25, Boulanger teaches a method computer-readable medium for clustering data in a virtual environment (col. 3 lines 33-45), comprising: ... <u>generating a common data stream</u>

200315392-1   Group Art Unit: 2154
Application No.: 10/684,033

9

based on said at least one clustering parameter (col. 5 lines 39-64); and <u>sending said common</u> <u>data stream</u> from a sending node <u>to said cluster of receiving nodes</u> (see fig 2-4; col. 5 line 39 to col. 6 line 9)" (Emphasis added; Page 2, last paragraph.)

Appellants respectfully submit that Boulanger does not anticipate "<u>generating a</u> <u>common data stream</u> based on said at least one clustering parameter; and <u>sending said</u> <u>common data stream</u> from a sending node <u>to said cluster of receiving nodes</u>" (emphasis added) as recited in Appellants' Claim 1. Appellants understand Boulanger to disclose a system and method of stereo videoconferencing, in which for each participant, camera pairs are used "to capture a stereo pair of video images of each of the other participants.... For each participant, the system assembles a stereo video display image of a virtual meeting room, combining the stereo pair images <u>of each of the other participants</u> appropriately sized and positioned." (Emphasis added; Boulanger, Abstract.)

Further, Boulanger focuses upon providing an illusion to the meeting participants of an immersion in a real meeting in 3D virtual space. Each meeting participant is sent stereo pairs of the other meeting participants. In other words, each meeting participant is receiving images of all the meeting participants, excepting themselves. Thus, each meeting participant is receiving a different image from any other meeting participant. Therefore, <u>different data</u> <u>streams are being sent to each meeting participant</u>.

Boulanger discloses a method of providing a meeting in 3D virtual space by sending stereo pairs <u>of each of the other meeting participants</u> to each meeting participant and thus <u>different data streams</u>, to create the illusion of an immersion in a real meeting in 3D virtual space. In contrast, Appellants' Claim 1 discloses <u>generating a common data stream</u>, and

200315392-1   Group Art Unit: 2154
Application No.: 10/684,033

10

sending the common data stream from a sending node to a cluster of receiving nodes in order to reduce the computational cost associated with producing each distinct data stream.

Additionally, since Boulanger involves sending different data streams to various meeting participants, Boulanger <u>fails to reduce the overall computational cost</u> as is an objective of Appellants' Claim 1 because Boulanger produces distinct data streams to each meeting participant.

Therefore, Appellants respectfully submit that Boulanger does not anticipate "<u>generating a common data stream</u> based on said at least one clustering parameter; and <u>sending said common data stream</u> from a sending node to said cluster of receiving nodes" (emphasis added) as is recited in Appellants' Claim 1.

Therefore, Appellants respectfully submit that Boulanger does not anticipate the features as are set forth in independent Claim 1, and as such, Claim 1 traverses the rejection under 35 U.S.C. §102(e) and is in condition for allowance. Accordingly, Appellants also respectfully submit that Boulanger does not anticipate Claims 16, 23, 25, and 40 for reasons stated herein regarding Claim 1. Furthermore, Appellants respectfully submit that Claims 2-9 and 15 dependent on Claim 1, Claims 17-22 dependent on Claim 16, and Claims 26-33 and 39 dependent on Claim 25, overcome the rejection under 35 U.S.C. §102(e) as being dependent on an allowable base Claim.

Appellants respectfully note that the instant Office Action omitted any explanation of the rejection of Claims 23 and 24. As such, Appellants respectfully submit that Claims 23

and 24 be allowable, as the 35 U.S.C. §102(e) rejection should be withdrawn since there is no explanation thereof.

2.   Whether Claims 10-14 and 34-38 should be rejected under 35 U.S.C. §103(a) as being unpatentable over Boulanger in view of Elba.

Appellants respectfully submit that the combination of Boulanger and Elba does not satisfy the requirements of a *prima facie* case of obviousness because the combination of Boulanger and Elba fails to suggest the present invention as claimed. In order to establish a *prima facie* case of obviousness, the prior art must suggest the desirability of the claimed invention (MPEP 2142).

Additionally, "As reiterated by the Supreme Court in *KSR*, the framework for the objective analysis for determining obviousness under 35 U.S.C. 103 is stated in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966). Obviousness is a question of law based on underlying factual inquiries" including "[a]scertaining the differences between the claimed invention and the prior art" (MPEP 2141(II)). "In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious" (emphasis in original; MPEP 2141.02(I)). Appellants note that "[t]he prior art reference (or references when combined) need not teach or suggest all the claim limitations. However, Office personnel must explain why the difference(s) between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art" (emphasis added; MPEP 2141[III]).

Appellants respectfully submit that the combination of Boulanger and Elba fails to suggest the features of Appellants' Claim 1 because Elba does not overcome the shortcomings of Boulanger as provided in the response under U.S.C.§102(e) above and incorporated in its entirety herein.

Appellants understand Elba to teach an input module which is operative to receive a compressed video input stream, manipulate the compressed video stream into a primary stream and optionally generate a secondary data stream associated with the primary data stream. (Elba, Abstract.) Specifically, Elba does not teach, describe, or suggest "generating a common data stream based on said at least one clustering parameter; and sending said common data stream from a sending node to said cluster of receiving nodes" (emphasis added) as recited in Appellants' Claim 1.

Thus, in view of the combination of Fox and Burrows not satisfying the requirements of a *prima facie* case of obviousness, Appellants respectfully assert that Claim 1 and 25, which includes similar features to that of Claim 1, is also patentable. Moreover, Appellants respectfully submit that Claims 10-14 depending upon Claim 1 and Claims 34-38 depending upon Claim 25 are patentable as being dependant upon an allowable base Claim.

Conclusion

Appellants believe that pending Claims 1-40 are directed toward patentable subject matter. As such, Appellants respectfully request that the rejections of Claims 1-40 be reversed.

The Appellants wish to encourage the Examiner or a member of the Board of Patent Appeals to telephone the Appellants' undersigned representative if it is felt that a telephone conference could expedite prosecution

<div align="right">

Respectfully submitted,
WAGNER BLECHER LLP

</div>

Dated: 4/21/2008   /John P. Wagner, Jr./
                                               John P. Wagner, Jr.

Registration No. 35,398

Wagner Blecher LLP
123 Westridge Drive
Watsonville, CA 95076
(408) 377-0500

<u>VIII. Appendix - Clean Copy of Claims on Appeal</u>

What is claimed is:

1. A method for clustering data in a virtual environment, comprising:

determining a cluster of receiving nodes in said virtual environment, wherein each of said cluster of receiving nodes have associated values for at least one clustering parameter that as a set satisfies a test;

generating a common data stream based on said at least one clustering parameter; and

sending said common data stream from a sending node to said cluster of receiving nodes.

2. The method of Claim 1, wherein said generating a common data stream further comprises:

generating a common video image stream as said common data stream of an object associated with said sending node using a new view synthesis technique, wherein said common video image stream is rendered from a common perspective in said virtual environment that is associated with said cluster of receiving nodes.

3. The method of Claim 2, wherein said common perspective is calculated from an average of said at least one clustering parameter.

4. The method of Claim 2, further comprising:

generating a three-dimensional model of said object to which said new view synthesis technique is applied to generate said common video image stream.

5. The method of Claim 1, wherein data streams associated with said cluster of receiving nodes are substantially similar.

6. The method of Claim 1, wherein said sending said common data stream further comprises:

multicasting said common data stream from said sending node over a communication network to said cluster of receiving nodes to achieve communication network traffic efficiency.

7. The method of Claim 1, wherein said at least one clustering parameter comprises a view dependent clustering parameter that defines an associated perspective of a receiving node within said virtual environment, wherein each of said cluster of receiving nodes is spatially located in said virtual environment, such that their respective perspectives are similar resulting in said clustering parameter that is shared.

8. The method of Claim 1, wherein said at least one clustering parameter comprises a temporal clustering parameter, wherein each of said cluster of receiving nodes require substantially the same frame rate, such that their respective data quality requirements are similar.

9. The method of Claim 1, wherein said at least one clustering parameter comprises a spatial clustering parameter, wherein each of said cluster of receiving nodes require substantially the same resolution parameter value, such that their respective data resolution requirements are similar.

10. The method of Claim 9, further comprising:
limiting resolution of said common data stream based on resolution capabilities of display devices associated with said cluster of receiving nodes.

11. The method of Claim 9, further comprising:
increasing a resolution parameter value of a receiving node as said sending node becomes more important to said receiving node in said virtual environment; and
decreasing said resolution parameter value as said sending node becomes less important to said receiving node in said virtual environment.

12. The method of Claim 11, further comprising:
valuing an importance of said sending node based on whether a receiving node is gazing at a representation of said sending node in said virtual environment.

13. The method of Claim 11, further comprising:

valuing an importance of said sending node based on how close to a center of a monitoring device associated with said receiving node is a representation of said sending node displayed.

14. The method of Claim 11, further comprising:

valuing an importance of said sending node based on whether said sending node is speaking.

15. The method of Claim 1, wherein said determining a cluster of receiving nodes further comprises:

dynamically changing said test for determining said cluster of receiving nodes in said virtual environment in response to changing conditions for computational resources in a communication network supporting said virtual environment and said cluster of receiving nodes.

16. A system for clustering data in a virtual environment, comprising:

a clustering module for determining a cluster of receiving nodes in said virtual environment, wherein each of said cluster of receiving nodes have associated values for at least one clustering parameter that as a set satisfies a test;

a data generator for generating a common data stream based on said at least one clustering parameter; and

a transmitter for sending said common data stream from a sending node to said cluster of receiving nodes.

17. The system of Claim 16, wherein said at least one clustering parameter comprises a view dependent clustering parameter, wherein each of said cluster of receiving nodes is spatially located in said virtual environment, such that their respective perspectives are substantially similar.

18. The system of Claim 16, wherein said at least one clustering parameter comprises a temporal clustering parameter, wherein each of said cluster of receiving nodes

require substantially the same frame rate, such that their data quality requirements are substantially similar.

19. The system of Claim 18, wherein said frame rate is increased as said cluster of receiving nodes is located closer to said sending node in said virtual environment.

20. The system of Claim 16, wherein said at least one clustering parameter comprises a spatial clustering parameter, wherein each of said cluster of receiving nodes require substantially the same resolution, such that their respective data quality requirements are substantially similar.

21. The system of Claim 20, wherein said resolution is dependent on a value of importance said sending node is to a receiving node, such that higher values of importance are associated with higher resolution.

22. The system of Claim 16, wherein said virtual environment comprises an N-way virtual collaborative environment.

23. A method for clustering data, comprising:
determining a cluster of receiving nodes among a plurality of receiving nodes, wherein a plurality of varying data streams are generated by a sending node for all of said plurality of receiving nodes depending on an associated value of a parameter for all of said plurality of receiving nodes, and wherein each of said cluster of receiving nodes have associated values for said parameter that as a set satisfies a test such that data streams associated with said cluster of receiving nodes are substantially similar;
generating a common data stream of a sending object associated with said sending node based on a representative value of said parameter; and
sending said common data stream to said cluster of receiving nodes.

24. The method of Claim 23, wherein each of said cluster of receiving nodes have associated values for a group of parameters that as said set satisfies said test such that data streams based on said group of parameters and associated with said cluster of receiving nodes are substantially similar.

25. A computer readable medium containing executable instructions which, when executed in a processing system, causes the system to perform the steps for clustering data in a virtual environment, comprising:

determining a cluster of receiving nodes in said virtual environment, wherein each of said cluster of receiving nodes have associated values for at least one clustering parameter that as a set satisfies a test;

generating a common data stream based on said at least one clustering parameter; and

sending said common data stream from a sending node to said cluster of receiving nodes.

26. The computer readable medium of Claim 25, wherein said generating a common data stream in said method further comprises:

generating a common video image stream as said common data stream of an object associated with said sending node using a new view synthesis technique, wherein said common video image stream is rendered from a common perspective in said virtual environment that is associated with said cluster of receiving nodes.

27. The computer readable medium of Claim 26, wherein said common perspective is calculated from an average of said at least one clustering parameter.

28. The computer readable medium of Claim 26, wherein said method further comprises:

generating a three-dimensional model of said object to which said new view synthesis technique is applied to generate said common video image stream.

29. The computer readable medium of Claim 25, wherein data streams associated with said cluster of receiving nodes are substantially similar.

30. The computer readable medium of Claim 25, wherein said sending said common data stream in said method further comprises:

multicasting said common data stream from said sending node over a communication network to said cluster of receiving nodes to achieve communication network traffic efficiency.

31.   The computer readable medium of Claim 25, wherein said at least one clustering parameter comprises a view dependent clustering parameter that defines an associated perspective of a receiving node within said virtual environment, wherein each of said cluster of receiving nodes is spatially located in said virtual environment, such that their respective perspectives are similar resulting in said clustering parameter that is shared.

32.   The computer readable medium of Claim 25, wherein said at least one clustering parameter comprises a temporal clustering parameter, wherein each of said cluster of receiving nodes require substantially the same frame rate, such that their respective data quality requirements are similar.

33.   The computer readable medium of Claim 25, wherein said at least one clustering parameter comprises a spatial clustering parameter, wherein each of said cluster of receiving nodes require substantially the same resolution, such that their respective data resolution requirements are similar.

34.   The computer readable medium of Claim 33, wherein said method further comprises:
    limiting resolution of said common data stream based on resolution capabilities of display devices associated with said cluster of receiving nodes.

35.   The computer readable medium of Claim 33, wherein said method further comprises:
    increasing a resolution parameter value of a receiving node as said sending node becomes more important to said receiving node in said virtual environment; and
    decreasing said resolution parameter value as said sending node becomes less important to said receiving node in said virtual environment.

36. The computer readable medium of Claim 35, wherein said method further comprises:

valuing an importance of said sending node based on whether a receiving node is gazing at a representation of said sending node in said virtual environment.

37. The computer readable medium of Claim 35, wherein said method further comprises:

valuing an importance of said sending node based on how close to a center of a monitoring device associated with said receiving node is a representation of said sending node displayed.

38. The computer readable medium of Claim 35, wherein said method further comprises:

valuing an importance of said sending node based on whether said sending node is speaking.

39. The computer readable medium of Claim 25, wherein said determining a cluster of receiving nodes in said method further comprises:

dynamically changing said test for determining said cluster of receiving nodes in said virtual environment in response to changing conditions for computational resources in a communication network supporting said virtual environment and said cluster of receiving nodes.

40. A computer system comprising:

a processor; and

a computer readable memory coupled to said processor and containing program instructions that, when executed, implements a method for clustering data, comprising:

determining a cluster of receiving nodes among a plurality of receiving nodes, wherein a plurality of varying data streams are generated by a sending node for all of said plurality of receiving nodes depending on an associated value of a parameter for all of said plurality of receiving nodes, and wherein each of said cluster of receiving nodes have associated values for said parameter that as a set satisfies a test such that data streams associated with said cluster of receiving nodes are substantially similar;

generating a common data stream of a sending object associated with said sending node based on a representative value of said parameter; and

sending said common data stream to said cluster of receiving nodes.

IX. Evidence Appendix

No evidence is herein appended.

X. Related Proceedings Appendix

No related proceedings.